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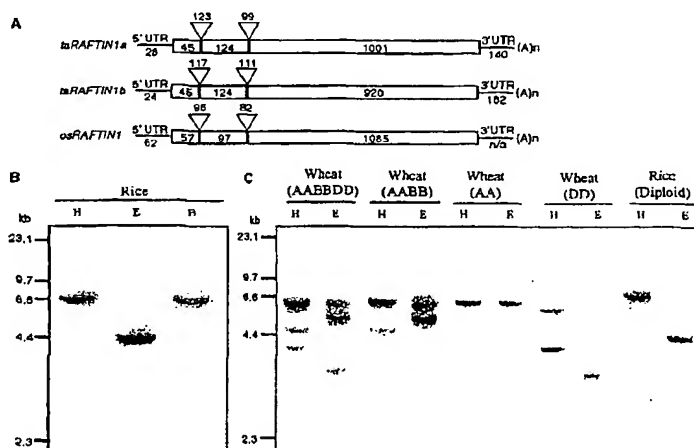
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(54) Title: PROTEIN CONTAINING A BURP DOMAIN



(57) Abstract: The anther recruits a number of specific-genes to support microspore development. Here we report identification of a novel gene, RAFTIN1, from bread wheat and rice, encoding a protein containing a BURP domain hallmarked with 4 CII repeats at its C-terminus. This single copy gene (per haploid complement in cereals) is exclusively expressed in the tapetum during post-meiotic stages when the young microspore undergoes rapid expansion. RAFTIN1 is biosynthesized in the tapetum, transported into the Ubisch body, and further deposited onto the microspore exinewall. Transgenic rice, in which RAFTIN1 expression is down-regulated, shows normal growth and development but also shows male sterility. In the RAFTIN1-less anther, tapetal degeneration is retarded and pollen lacks contents. Thus, RAFTIN1 assembly in the Ubisch body and the microspore exinewall is required for microspore development, probably for regulation of metabolite transport from the tapetum to the microspore. Silencing or knocking-out of RAFTIN will find utility in breeding programs wherever male sterile lines are required.